

history, and since the possibility of catheter infection can be excluded also. Another important question which cannot be answered concerns the relationship between the symptoms of which the patient complained following the febrile attack in July and the occurrence of typhoid bacilli in his urine. If the patient was a urinary carrier it is difficult to explain the symptoms, for the carrier state is unfortunately peculiarly lacking in symptoms except in those carriers in whom there is sufficient gall-bladder trouble to attract attention. Whether "typhoid spine" may occur in carriers or bear any relation to the carrier state is unknown. Nor did this patient's symptoms agree entirely with the picture of "typhoid spine."

On the other hand the urinary findings in this case are not those of actual infection of the urinary tract with the typhoid bacillus. The typhoid bacillus may produce cystitis, pyelitis, pyonephrosis and even an acute urethritis, but in all these instances there is a pyuria in which the usual polymorphonuclear neutrophile predominates. No such pyuria was observed in this patient. A search of the literature reveals no statement as to the cellular elements in the urine of urinary typhoid carriers nor any description of the occurrence of phagocytic endothelial cells, although there seems no good reason why these cells should not reach the urine, as they are found in tubular nephritis lying free in the urinary tubules busily engulfing necrotic epithelial cells.

There is still doubt as to the origin of the typhoid bacilli found in urinary carriers, and the direct relation of gall-bladder infection needs further demonstration. The possibility of foci in the urinary bladder or even in the kidney has not been excluded nor has the possibility that under certain conditions, such as perhaps trauma or secondary infection, the quiescent foci of the carrier state might be transformed into active infection of the urinary tract. It is remotely possible that this case was an example of this kind.

Aside from these speculations, which are bound to be inconclusive, the fact remains that in this instance a most unusual cellular picture in the urine was observed, and, whether rightly or wrongly, a line of reasoning was followed which led to the discovery of typhoid bacilli in the patient's urine and of a positive Widal test in the blood serum.

This experience suggests that something may be learned from the study of the cells in the urine of urinary typhoid carriers, and that the recognition of endothelial leukocytes in the urine may be helpful diagnostically.

A CONSIDERATION OF CERTAIN ASPECTS OF PROTEIN HYPERSENSITIVENESS IN CHILDREN.

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At the present time it is not unusual to see infants and children who are hypersensitive to proteins and who manifest their sensitiveness by a number of different clinical symptoms. Nearly everyone knows of individuals who are made ill, regularly, after eating fruit or shell-fish, or who are unable to come closely in contact with animals or grasses without developing hay fever or asthma. This idiosyncrasy or susceptibility to various substances has been recognized for a long time. Among the earlier medical writings on this subject are those of Elliotson,¹ Hutchinson² and Blackley.³ Elliotson drew attention, in 1831, to the association between the pollen of plants and hay fever while Blackley, in 1873, not only recognized this association but produced edema and congestion of the conjunctiva by the instillation of certain pollens in the eyes of hay-fever patients. He also observed that the pollens produced an area of edema and erythema when rubbed into the abraded skin of such patients. In 1884 Hutchinson referred to a number of patients who complained of nausea, vomiting and abdominal discomfort, and he believed these symptoms were due to the eating of egg, as the symptoms disappeared when egg was withheld from the diet. He stated also that certain individuals might be susceptible to other articles of food, such as honey, tea, coffee and different fruits and vegetables.

The more common and characteristic features of hypersensitiveness to proteins, which occur in infants and children, are shown by the following case reports:

CASE I.—An infant, who had been exclusively breast-fed, was given, when six weeks old, a small amount of cows' milk. This was immediately vomited. One month later one-half teaspoonful of milk caused a severe general reaction. The baby vomited and had diarrhea. He became cyanosed and so prostrated that the physician considered him dangerously ill. Bread prepared with cows' milk brought on a similar reaction, as did the administration of three drops of a 1 in 12 dilution of condensed milk. Cows' milk in any form and in infinitesimal amounts always caused vomiting, loose stools, cyanosis, irregular respirations and prostration. He

¹ Clinical Lecture, March 31, 1831, *Lancet*, 1830-31, xx, 370.

² The Pedigree of Disease, p. 28.

³ Experimental Researches on the Cause and Nature of Hay Fever, London, 1873.
VOL. 160, NO. 3.—SEPTEMBER, 1920. 12

was able to take goats' milk without any symptoms. In order to determine that the symptoms were due to cows' milk the protein of cows' milk was applied to the skin. This was followed by an area of edema and erythema after four hours. When introduced in this manner cows' milk caused the same general symptoms as when taken by mouth. Protein from beef, egg, horse serum, barley, human milk and goats' milk caused no reaction when applied to the skin. The baby was nursed at the breast and given supplemental feedings of goat's milk until ten months old, after which minute amounts of cows' milk was given by mouth. Gradually the amount was increased until the hypersensitiveness to cows' milk was overcome. The paternal aunt had an idiosyncrasy to shellfish and the paternal grandfather and great-grandfather had asthma.

CASE II.—An infant, aged two years, was breast-fed for two months, after which he was given a formula of cows' milk. Cereals, broths and vegetables were added subsequently. Eczema appeared when he was one month old, and it had been persistent. When one year old he was given a soft-boiled egg. This was immediately vomited and he was sick for several hours. Six months later egg was given and he again vomited. The protein of egg, cows' milk, barley, horse serum and beef gave a marked reaction when applied to the skin. By omitting eggs, meats and milk from the diet the eczema improved, and by giving them in small amounts and gradually increasing them he was finally able to take these foods without a return of the eczema. The mother had eczema when she was an infant.

CASE III.—The patient, a girl, aged four and a half years, was breast-fed until she was ten months old. When eight months old an egg shampoo caused a severe urticaria of the head and face. About the same time the eating of a teaspoonful of custard caused a generalized urticaria, with marked swelling about the mouth. When twenty-two months old she became violently ill following the eating of custard, and was thought to have "ptomain poisoning." It was not realized at this time that the symptoms were caused by egg. Urticaria always followed the ingestion of egg in any form. Urticaria also followed the eating of peanuts and walnuts. The protein of egg was rubbed on the skin and a huge urticarial-like wheal appeared immediately. After forty-five minutes urticaria appeared all over the body and the eyes, ears, lips and vulva became swollen and red. The patient became nauseated and complained of abdominal pain and faintness. This patient has not been treated for hypersensitiveness to egg. A maternal aunt was sensitive to egg.

CASE IV.—The patient, aged four years, was given a small amount of egg when eight months old. She vomited immediately and had a generalized urticaria. Subsequently she was able to take egg in the small amount contained in cakes and pastry. When

eighteen months old asthma began. When the protein of egg was applied to the skin a huge urticarial-like wheal appeared. Egg and foodstuffs containing egg were excluded from the diet and she remained free from asthma for a year. Asthma then recurred. The protein of a number of different substances was applied to the skin and very definite positive reactions to cows' milk and beef were found. When egg, milk and meats were withheld the patient did not have asthma.

CASE V.—This patient was nine years old. When two years of age eczema appeared for the first time and persisted for four years. After that urticaria appeared and the eczema improved but did not entirely disappear. When eight years of age asthmatic attacks began and they recurred at rather frequent intervals afterward. It is interesting that the ingestion of cereals always caused a swelling of the mucous membranes of the mouth, which was accompanied by severe itching about the mouth. The protein of egg, beef, milk, oatmeal, barley and wheatena caused marked edema and erythema when applied to the skin. This patient is now undergoing treatment for hypersensitiveness to protein. A maternal aunt has asthma and the maternal grandmother has hay fever.

CASE VI.—The patient, aged ten years, was breast-fed four months and then weaned on account of a severe and extensive eczema. After the first year the eczema was less severe, but it persisted, and at the time of admission to the hospital, eczema involved the face, the flexor surfaces of the arms and the scrotum. Many different forms of treatment had been tried unsuccessfully. The sensitiveness to proteins was observed when six months old, when he was first given egg. Egg, fish and nuts always intensified the eczema, and the eating of any of them was followed almost immediately by a burning sensation in the throat, vomiting, diarrhea, edema of the lips and ears and urticaria. In addition to these manifestations, association with horses always causes urticaria and hay fever. A marked reaction of the skin was obtained with the protein of milk, egg, horse serum and horse dander. The patient was relieved by withholding egg, milk and meats from the diet, and, after being desensitized to them, has had no return of the symptoms.

Within the past few years much information relating to the nature of the symptoms, which are caused when a sensitive person comes in contact with various substances, has been obtained.⁴ It has been established definitely that the symptoms in these cases

⁴ The reader is referred to the articles by the following writers who have contributed largely to this subject and from which I have quoted freely: Schloss, O. M.: *Am. Jour. Dis. Children*, iii, 341. Talbot: *Boston Med. and Surg. Jour.*, 1914, xlxvi, 708. Longcope, W. T.: *Harvey Lecture*, 1915-16, p. 271. Cooke, Robert A., and Vander Veer, Albert: *Jour. Immun.*, i, 201. Walker, Chandler: *Oxford Medicine* ii, 115. Rackemann, F. M.: *Boston Med. and Surg. Jour.*, 178, 770. Kolmer *Infection, Immunity and Specific Therapy*, second edition, p. 614.

are due to protein which is contained in the substances to which the patients react.

In many ways human sensitization, as it is generally termed, is analogous to the anaphylactic reaction in animals. There is a close similarity between many of the clinical manifestations observed in man and those seen in anaphylactic shock in animals. The specific skin sensitiveness in animals and the skin reaction observed in serum disease closely resemble the protein skin reaction, which constitutes an important feature is the condition under discussion.

It is not necessary in this communication to give in detail the many experiments which have been undertaken to demonstrate a relationship between human sensitization and experimental anaphylaxis in animals. Human sensitization is not identical with the artificial sensitization with antitoxin sera or with experimental anaphylaxis in animals. They differ in certain respects, and definite conclusions should not be drawn until these differences have been subjected to more careful experimental investigation.

The hypersensitive state may be present at birth, and this is the rule in a large percentage of the cases, so that severe and even alarming manifestations result at the primary contact with the protein. In the case reported by Park,⁵ vomiting and diarrhea and cyanosis and prostration were induced when the infant received for the first time only a small amount of cows' milk. Less severe manifestations, as eczema, urticaria and asthma, may develop as well when the protein is first given. The symptoms may not, however, be manifest at the initial contact with the protein but develop at a later period, as illustrated by the following case. Egg albumen was given to an infant of three months for several days without any apparent reaction. When a coddled egg was given at the age of nine months, however, vomiting, generalized urticaria and asthma followed immediately. In other cases evidences of protein sensitization may be present during infancy and then entirely disappear, but after several years either similar or, as more often is the experience, different clinical manifestations develop. Thus a patient who has never received egg or cows' milk may have eczema throughout infancy which entirely disappears, to be followed in early childhood by asthmatic attacks with or without eczema. It is easy to understand the constant production of symptoms in a person once he has become sensitized to protein, as the avenues for entrance of protein are so very numerous and the patient is so constantly brought in contact with protein; but the manner in which the primary sensitization takes place is not so readily explained.

Sensitization may be acquired, it may be conveyed from the mother to the infant or it may be inherited. It is quite conceiv-

⁵ A Case of Hypersensitiveness to Cows' Milk, *Am. Jour. Dis. Children*, xix, p. 46.

able that a person might become sensitized through an open wound in the skin, through the mucous membranes of the gastro-intestinal tract and various other ways. Sensitization is acquired undoubtedly in one of these ways in a certain number of cases. The transference of sensitization from an animal to the offspring, which has been demonstrated by Wells⁶ and others, would suggest that human sensitization might take place in the same way. While not improbable it undoubtedly is infrequent. Experimental transference of sensitization differs greatly from human sensitization. In animals the sensitization transferred from the mother lasts but a few weeks and is not transmitted from generation to generation, while in human sensitization quite the reverse obtains. In all probability sensitization is inherited in those patients who exhibit manifestations when they are brought in contact with the protein for the first time. A family history of sensitization can be obtained in nearly all of these cases, and there are numerous cases recorded in which the sensitization has been transmitted through several generations. The sensitization, which does not have to be to the same protein, may be transmitted through the maternal or paternal ancestors. The studies of Vander Veer and Cooke substantiate this view. They showed that hypersensitiveness to protein may be inherited, and that in a general way it follows the principles of the Mendelian law of heredity.

Hypersensitiveness to protein may be established by observing the clinical symptoms which are caused by the different substances and from the history. A history of hypersensitiveness may be obtained not only from the immediate members of the family, but in the family history dating back for several generations. The occurrence of asthma, eczema, urticaria, etc., in any member of the family is suggestive evidence of hypersensitiveness. Such a history is found in a large proportion of the patients, as illustrated by the following cases: A patient, aged five years, who suffered from asthma, gave a history of asthma having occurred in the paternal great-grandfather, grandfather and the father. The skin test in this patient was positive to the protein of egg. In another patient who had asthma following the ingestion of egg the first and second cousins had an idiosyncrasy to egg.

The symptoms oftentimes are so striking and so characteristic that they afford abundant proof of hypersensitiveness. In other cases the symptoms may be so indefinite that the illness does not appear to be related to protein sensitiveness. The local reaction which is produced when protein is applied or injected into the skin of hypersensitive persons is accepted by the majority of observers as an evidence of this state. The cutaneous or intracutaneous method may be employed for this purpose.

⁶ Jour. Infect. Dis., 1911, 160.

In the cutaneous method the skin is scarified with a needle or von Pirquet scarifier and the substances used for the test gently rubbed in. The scarification should be superficial and blood should not be drawn. A positive reaction is shown by the appearance of an urticarial-like wheal at the point of scarification. The reaction appears within the first five minutes, increases rapidly and reaches its height in ten to fifteen minutes. It gradually subsides, but in the majority of instances the edema persists thirty minutes or more. A control test should always be made, as in certain individuals a slight erythema with edema may appear at the point of scarification alone. A slight reaction may take place about the substances which react negatively, but it is easily differentiated from the positive reactions. It is never so intense and disappears within ten to fifteen minutes. The pure dried proteins for this test may be obtained from a number of commercial laboratories. When they are used a drop of tenth normal sodium hydrate solution is mixed with the dried proteins to facilitate solution.

In the intracutaneous method the protein in solution is injected into the skin by means of a small tuberculin syringe and fine needle. A positive result is indicated by a reaction similar to that obtained with the cutaneous method. The erythema and the edema gradually increase and attain their maximum height in the first fifteen minutes. They persist usually for thirty minutes or more. A reaction often occurs at the site of the control and of the negatively reacting substance, but it is never so intense, and the area of edema reaches its maximum diameter in five to ten minutes and gradually subsides within fifteen to twenty minutes. At times the erythema marking the site of the injection may persist in positive reactions for from twelve to twenty-four hours. It is advisable to observe the reaction for some time, for that which may at first appear to be a negative reaction occasionally becomes a positive reaction (delayed). The true reaction has to be differentiated from the traumatic or non-specific reaction which sometimes occurs, but this should not be difficult. When the reactions are negative by the cutaneous method they should be repeated with the intracutaneous method. The reactions from the intracutaneous method are more difficult to interpret than are those from the cutaneous method; on the other hand, they are more delicate. As a rule the reactions are sharp and distinct and with experience a differentiation between negative and positive reactions is not difficult.

When properly performed and interpreted, accurate information regarding the sensitiveness to the proteins tested is obtained with this test. A positive reaction indicates sensitization and a negative reaction indicates non-sensitization. Equivocal reactions may occur. A patient may exhibit clinical manifestations and give a negative reaction or a positive skin reaction may be present without the patient giving any clinical signs of sensitiveness. These are

exceptions to the rule and are seen infrequently. Care should be used in making the tests, as severe and alarming symptoms may follow the application of protein to the skin in the highly sensitized patient. One infant, hypersensitive to cows' milk, had a severe systemic reaction following the cutaneous application of a dilute solution of cows' milk, and another infant with a generalized eczema presented the symptoms of anaphylactic shock following the intracutaneous injection of a 1 to 100 dilution of egg white. Also a boy of seven years, who was hypersensitive to egg, reacted violently with urticaria, angioneurotic edema and asthma after the cutaneous application of a 1 to 100 solution of egg white. Similar reactions have been observed in other patients. The most severe reactions have followed the test with the proteins of egg white, cows' milk and of pollens. That systemic reactions may follow the inoculation of protein in the skin of a sensitized person is not surprising when one considers the infinitesimal amount of protein which will incite an attack of asthma in a person sensitive to horse dander, the pollens of grass, etc. In infants and children the reaction to only one protein should be determined at a time and the cutaneous method should be tried before the intracutaneous method.

Infants and young children, as a rule, are not sensitive to such a variety of proteins as are adults, but even in them a number of different proteins have to be used in testing for sensitization. The protein of egg, milk, cereals and meats, horse serum and dander, timothy, red-top and rag-weed are the more common substances to which children are sensitive. The selection of the proper proteins for the test, obviously, is a matter of much practical importance. Information necessitating the test with other proteins may be obtained after careful investigation. This is illustrated by the unique experience with a young girl with asthma who gave negative reactions to the proteins used in the routine tests. The asthmatic attacks occurred only when the patient was in one locality. After careful questioning it was found that the attacks were incited by handling purple asters.

As mentioned above, attention is usually attracted to this condition by the occurrence of eczema, asthma, hay fever, urticaria and angioneurotic edema or from the history of vomiting and diarrhea and general prostration when a certain food is given. The symptoms may be limited to one manifestation or various manifestations may occur in the same patient. The degree of sensitization as determined by the symptoms varies not only in different patients but in the same patient from time to time. Patients are frequently seen who come in contact with the offending protein, and yet there may be no clinical manifestations or they may be slight for long periods at a time, and then a severe reaction will occur. On the other hand, even the most minute quantity of the offending protein

is followed regularly by a violent reaction. The patient may lose his sensitiveness altogether or it may persist through life. Sometimes sensitiveness to other proteins is acquired.

All investigators have observed in these patients that there may be not only the history of sensitiveness to a number of substances but that the skin test is usually positive to more than one protein. The same patient may be sensitive to any one protein or to any combination of proteins from the same animal, or from the seed, the pollen and the leaves of a plant. On the other hand the same person may be sensitive to a number of proteins less closely related, as the protein derived from a plant and from an animal. This is true in asthma and eczema, in fact, in all of the clinical manifestations of protein sensitization. In the patient studied by Schloss, positive skin reactions were obtained to egg, oatmeal and almonds. In the patients with eczema studied by the writer,⁷ positive reactions were obtained with the protein of human milk, cows' milk, barley and horse serum. A patient of seven years with eczema, urticaria and hay fever gave positive reactions to the protein of egg, barley, horse serum, walnuts and rag-weed. That these patients are sensitive to more than one protein, even closely related proteins and to proteins unrelated biologically, is not so surprising when it is remembered that the specificity of the anaphylactic reaction in animals is determined not only by the biological origin of the proteins but by their chemical structure.

A phenomenon comparable to the refractory state or anti-anaphylactic state in animals is occasionally seen. Schloss⁸ observed this in two patients who developed a generalized urticaria within one to three hours following the ingestion of egg. The positive skin reaction disappeared for twenty-two to forty days, and during this period the ingestion of egg was not followed by the usual clinical manifestations. With the reappearance of the skin reaction, egg again caused an urticaria. In one patient with asthma due to egg, whom I was desensitizing by subcutaneous injection of the protein of egg, a similar phenomenon occurred. A severe attack of asthma was precipitated by the ingestion of egg which the child obtained without the parents' knowledge. The skin reaction was positive for a period of ten days, after which the reaction was not determined, but the asthma did not recur for nearly two months; during this time she ate egg daily. It would be of much therapeutic value were it possible to produce the refractory state in a sensitized patient, but at present no satisfactory method has been devised.

Treatment of patients with hay fever and asthma due to the inhalation of pollens, the emanations from animals and absorption

⁷ Blackfan, K. D.: *Am. Jour. Dis. Children*, xxi, 441.

⁸ *Tr. Am. Pediat. Soc.*, 1915, xxvii, 60.

from bacterial proteins has been extensively carried out by a number of workers. The procedures employed are so well known that further reference will not be made to them here. I shall, however, mention briefly the essential principles regarding the management of those patients who, on account of their hypersensitiveness to the various foods, develop eczema, urticaria, asthma, etc.

The treatment may be carried out by absolutely omitting the protein from the diet or by the process of desensitization. In certain cases a combination of these methods may be used.

Omitting certain proteins from the diet may occasion so much difficulty that it is oftentimes unsatisfactory even with the undivided attention of a responsible attendant. Also such a procedure should be undertaken with caution, especially in infants, as much harm can be done if in addition to the symptoms of hypersensitiveness there are added severe disturbances of nutrition. This is particularly liable to occur when milk is withheld from the diet of infants with eczema. In these patients, although it has been shown that the eczema can be benefited by temporarily withholding milk and other protein foods, it seems to me that treatment of their hypersensitiveness should not be started until they have reached the age when milk does not play such an important role in their nutrition.

It may be found by experience that the absolute omission of the protein is not necessary, as there is a very considerable variation in the reaction of different patients to the ingestion of various food proteins. A patient may be able to eat small quantities of a food without symptoms while large amounts bring out a severe reaction, or a patient may be able to take the food if it has been subjected to a high temperature, which renders the active properties of certain proteins inactive. The specific protein may not be present in a sufficiently high percentage in certain foods to bring about a reaction when ingested even though a positive skin test has been obtained.

Desensitization of the patient to protein is by all means the most satisfactory method of procedure. The time required for desensitization depends largely on the degree of sensitiveness and varies with each patient. The subcutaneous injection method is tedious, and, as it is particularly trying to infants and young children, I have come to rely almost entirely on desensitizing them by administering the protein by mouth. Meats, milk and cereals may be given in small amounts in solution. The protein of egg is best given in capsules.⁹ The initial dose is that which fails to give a

⁹ I am indebted to Mr. Dunning, of Hynson, Westcott & Dunning, of Baltimore, for his assistance in the preparation of the egg-white in capsule form, which has been used in these cases.

positive skin reaction. The rapidity with which the amount is increased depends to a great extent on the degree of sensitiveness. In each case the process of desensitization should be controlled by frequent skin tests. The aim should be not only to have the patient able to ingest the protein without a systemic reaction but to secure a negative skin reaction. It is surprising how difficult it may be to accomplish the latter. For practical purposes desensitization may be said to be completed when the patient is taking average amounts of the substance without recurrence of the symptoms. It should be remembered that the proteins, even after the patient has become able to take them by mouth in quantity, must be given regularly, as there is always the possibility of a return of the symptoms if this is not done.

Patients with only one clinical manifestation, as those who suffer from eczema, urticaria or asthma, and in whom there is a positive skin reaction to only one protein, should be given a diet from which the protein has been excluded. This should be maintained until the symptoms have disappeared. After that, desensitization may be begun by the administration of the protein to which he is sensitive.

Patients who are susceptible to a combination of proteins are the most difficult to treat. The special proteins to which they are sensitive should be excluded from the diet, and in addition protein from eggs, meat and milk even if a negative skin test is obtained to them. The reason for excluding such foods is more or less empirical. After the clinical manifestations have subsided entirely the proteins to which the patient is least sensitive, as shown by the skin test or by the reaction following their ingestion, are administered. After there has been no return of the symptoms for some time the process of desensitization with the protein which gives the most intense reaction may then be commenced. Recurrence of the symptoms at any time necessitates the withholding of the special proteins from the diet until the symptoms have subsided. Desensitization is then begun again.

Successful therapeutic results may be expected in patients who are unable to take various foods without the development of eczema, urticaria, asthma, etc., if the patients are hypersensitive to protein and if the treatment is consistently and thoroughly carried out.

THE COLON IN CONNECTION WITH CHRONIC ARTHRITIS (ARTHRITIS DEFORMANS).¹

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In July, 1912, a single woman, aged thirty-four years, a school-teacher, was referred to me for treatment of an intestinal condition. She had a typical polyarthritis involving the phalanges, wrist, elbow, tarsal, ankle- and knee-joints, which in five years had reduced her to an invalid's chair existence. Her relapses of joint involvement were frequent, each attack rendering the joints more crippled in a permanent way. A constipation came on with the initial joints affected (both elbows), and she stated that if her bowels had not moved that day she was distinctly stiffer throughout the body that night. She had lost weight, her tissues were flabby, a psoriasis had developed, the liver was noticeably enlarged and there was a slight amount of albumin in the urine, with many granular casts. The studies of the feces showed the presence of gas-bacillus infection of the gut. She was treated by a diet high in calories, but low in calcium, and by strains of viable *Bacillus coli* rectally administered. The treatment was kept up for seven months, at which time she was markedly improved. In the fall of 1913 she resumed her work as teacher of French in the Wadleigh High School and has not lost a day since. She lives the life of a normal woman, attends to her apartment after school hours, cooks her own foods, goes to the theater and dances in the evenings, and, with the exception of some crippled joints, in which there has not been one remission from the beginning of treatment, she is a normal woman.

This happy result in the treatment of an intestinal toxemia seemed to qualify me in the eyes of some lay people as one especially able to treat such conditions. In the New England town that the case came from there were three others that soon were under observation, and from this nucleus it has spread from Maine to Pennsylvania until today 79 cases, supposedly like hers, have been seen. These have comprised a group of cases that deserve recording, both as to the findings and results accomplished. Of these, 31 were deemed unsuitable to be classed as typical ones of polyarthritis. They were made up of instances of gouty joints, syphilis, myositis, true articular rheumatism more or less resolved, acute joint involvement from manifest focal infections that were easily removed (nothing more being done in the treatment of the arthritis), and 3 extreme cripples so seriously involved with manifest disease of internal organs (mainly

¹ Read before the Academy of Medicine, March 19, 1920.